

**APPARATUS AND METHOD OF DISPLAYING ELECTRONIC DESKTOPS BASED  
ON A SCHEDULER OR NETWORK CONNECTION**

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**BACKGROUND OF THE INVENTION**

**1. Technical Field:**

The present invention is directed to electronic desktops. More specifically, the present invention is directed to an apparatus and method of selecting an active electronic desktop based on a scheduler or network connection.

**2. Description of Related Art:**

At present, the most commonly used user interface paradigm for computing devices is the windows-icons-desktop-folders metaphor prevalent on computer systems such as the Macintosh or other computer systems running the Microsoft Windows operating system. Under this paradigm, the screen of a computer system simulates an office desktop that contains various objects. The objects are represented as graphical "icons" that can be opened as "windows" on the screen. A user can create an unlimited number of overlapping windows, and the size of the windows can be adjusted dynamically. The user can also hierarchically create and manipulate "folders" that reflect how the information is organized on the computer system's storage devices.

Most users equate a desktop to the screen that is first displayed when a computer system is turned on. Note that here "screen" is used to include items such as icons, background image, screen saver image that are displayed as

well as video mode settings etc. used to display the items. Depending on the circumstance and environment (e.g., work) in which the computer system (e.g., a laptop) is being used, some icons, background image, screen saver image etc. may not be appropriate for display. In this case, the user has to delete the offending items from the desktop or replace them with others. However, in some other environments (e.g., away from work) the user may want these items displayed. Presently, a user can only have one desktop be automatically displayed whenever a computer system is turned on.

Thus, what is needed is an apparatus and method that automatically display a particular desktop based on the environment in which the computer system is being used.

### SUMMARY OF THE INVENTION

5 The present invention provides a method and apparatus  
for selecting a desktop from a plurality of desktops for use  
upon turning on a computer system. In an embodiment of the  
invention, it is first determined whether there is more than  
one desktop available in the computer system. If so, it is  
next determined whether any one of the desktops is  
associated with a scheduler. If so, the time specified in  
10 the scheduler is consulted. If the present time falls  
within the time in the scheduler, the desktop associated  
with the scheduler is used.

15 In another embodiment of the invention, a network  
address is associated with some or all of the available  
desktops. Upon turning the computer system on, the computer  
compares its network address with a network address  
associated with each of the desktops. If the computer  
system finds a network address that is the same as its  
network address, the computer system then uses the desktop  
20 associated the stored network address.

25 In yet another embodiment, a desktop may downloaded  
from the Internet for use. For instance, when a user  
accesses the Internet through an ISP, the ISP may download  
the desktop to be used.

**BRIEF DESCRIPTION OF THE DRAWINGS**

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Fig. 1 is an exemplary block diagram illustrating a distributed data processing system according to the present invention.

Fig. 2 is an exemplary block diagram of a server apparatus according to the present invention.

Fig. 3 is an exemplary block diagram of a client apparatus according to the present invention.

Fig. 4 depicts a display of a GUI used to access a desktop.

Fig. 5 illustrates a display of a GUI used to create items on a desktop.

Fig. 6 depicts a display of a GUI used to create items on a desktop used by the invention.

Fig. 7 depicts a display of GUI for accessing a desktop used by the invention.

Fig. 8 depicts a flow diagram of a first process used by the invention.

Fig. 9 illustrates a flow diagram of a second process used by the invention.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

With reference now to the figures, Fig. 1 depicts a pictorial representation of a network of data processing systems in which the present invention may be implemented. Network data processing system 100 is a network of computers in which the present invention may be implemented. Network data processing system 100 contains a network 102, which is the medium used to provide communications links between various devices and computers connected together within network data processing system 100. Network 102 may include connections, such as wire, wireless communication links, or fiber optic cables.

In the depicted example, server 104 is connected to network 102 along with storage unit 106. In addition, clients 108, 110, and 112 are connected to network 102. These clients 108, 110, and 112 may be, for example, personal computers or network computers. In the depicted example, server 104 provides data, such as boot files, operating system images, and applications to clients 108, 110 and 112. Clients 108, 110 and 112 are clients to server 104. Network data processing system 100 may include additional servers, clients, and other devices not shown. In the depicted example, network data processing system 100 is the Internet with network 102 representing a worldwide collection of networks and gateways that use the TCP/IP suite of protocols to communicate with one another. At the heart of the Internet is a backbone of high-speed data communication lines between major nodes or host

computers, consisting of thousands of commercial, government, educational and other computer systems that route data and messages. Of course, network data processing system 100 also may be implemented as a number of different  
5 types of networks, such as for example, an intranet, a local area network (LAN), or a wide area network (WAN). Fig. 1 is intended as an example, and not as an architectural limitation for the present invention.

Referring to Fig. 2, a block diagram of a data  
10 processing system that may be implemented as a server, such as server 104 in Fig. 1, is depicted in accordance with a preferred embodiment of the present invention. Data processing system 200 may be a symmetric multiprocessor (SMP) system including a plurality of processors 202 and 204  
15 connected to system bus 206. Alternatively, a single processor system may be employed. Also connected to system bus 206 is memory controller/cache 208, which provides an interface to local memory 209. I/O bus bridge 210 is connected to system bus 206 and provides an interface to I/O  
20 bus 212. Memory controller/cache 208 and I/O bus bridge 210 may be integrated as depicted.

Peripheral component interconnect (PCI) bus bridge 214 connected to I/O bus 212 provides an interface to PCI local bus 216. A number of modems may be connected to PCI local  
25 bus 216. Typical PCI bus implementations will support four PCI expansion slots or add-in connectors. Communications links to network computers 108, 110 and 112 in Fig. 1 may be provided through modem 218 and network adapter 220 connected to PCI local bus 216 through add-in boards.

Additional PCI bus bridges 222 and 224 provide interfaces for additional PCI local buses 226 and 228, from which additional modems or network adapters may be supported. In this manner, data processing system 200 allows connections  
5 to multiple network computers. A memory-mapped graphics adapter 230 and hard disk 232 may also be connected to I/O bus 212 as depicted, either directly or indirectly.

Those of ordinary skill in the art will appreciate that the hardware depicted in Fig. 2 may vary. For example,  
10 other peripheral devices, such as optical disk drives and the like, also may be used in addition to or in place of the hardware depicted. The depicted example is not meant to imply architectural limitations with respect to the present invention.

15 The data processing system depicted in Fig. 2 may be, for example, an IBM e-Server pSeries system, a product of International Business Machines Corporation in Armonk, New York, running the Advanced Interactive Executive (AIX) operating system or LINUX operating system.

20 With reference now to Fig. 3, a block diagram illustrating a data processing system is depicted in which the present invention may be implemented. Data processing system 300 is an example of a client computer. Data processing system 300 employs a peripheral component  
25 interconnect (PCI) local bus architecture. Although the depicted example employs a PCI bus, other bus architectures such as Accelerated Graphics Port (AGP) and Industry Standard Architecture (ISA) may be used. Processor 302 and main memory 304 are connected to PCI local bus 306 through  
30 PCI bridge 308. PCI bridge 308 also may include an integrated memory controller and cache memory for processor 302. Additional connections to PCI local bus 306 may be

made through direct component interconnection or through add-in boards. In the depicted example, local area network (LAN) adapter 310, SCSI host bus adapter 312, and expansion bus interface 314 are connected to PCI local bus 306 by direct component connection. In contrast, audio adapter 316, graphics adapter 318, and audio/video adapter 319 are connected to PCI local bus 306 by add-in boards inserted into expansion slots. Expansion bus interface 314 provides a connection for a keyboard and mouse adapter 320, modem 322, and additional memory 324. Small computer system interface (SCSI) host bus adapter 312 provides a connection for hard disk drive 326, tape drive 328, and CD-ROM drive 330. Typical PCI local bus implementations will support three or four PCI expansion slots or add-in connectors.

An operating system runs on processor 302 and is used to coordinate and provide control of various components within data processing system 300 in Fig. 3. The operating system may be a commercially available operating system, such as Windows 2000, which is available from Microsoft Corporation. An object oriented programming system such as Java may run in conjunction with the operating system and provide calls to the operating system from Java programs or applications executing on data processing system 300. "Java" is a trademark of Sun Microsystems, Inc. Instructions for the operating system, the object-oriented operating system, and applications or programs are located on storage devices, such as hard disk drive 326, and may be loaded into main memory 304 for execution by processor 302.

Those of ordinary skill in the art will appreciate that the hardware in Fig. 3 may vary depending on the implementation. Other internal hardware or peripheral devices, such as flash ROM (or equivalent nonvolatile



memory) or optical disk drives and the like, may be used in addition to or in place of the hardware depicted in Fig. 3. Also, the processes of the present invention may be applied to a multiprocessor data processing system.

5       As another example, data processing system 300 may be a stand-alone system configured to be bootable without relying on some type of network communication interface, whether or not data processing system 300 comprises some type of network communication interface. As a further example, data  
10       processing system 300 may be a Personal Digital Assistant (PDA) device, which is configured with ROM and/or flash ROM in order to provide non-volatile memory for storing operating system files and/or user-generated data.

      The depicted example in Fig. 3 and above-described  
15       examples are not meant to imply architectural limitations. For example, data processing system 300 may also be a notebook computer or hand held computer in addition to taking the form of a PDA. Data processing system 300 also may be a kiosk or a Web appliance.

20       The present invention provides an apparatus and method of displaying a particular desktop based on a network connection or a scheduler. The invention may be local to client systems 108, 110 and 112 of Fig. 1 or to the server 104 or to both the server 104 and clients 108, 110 and 112.  
25       Consequently, the present invention may reside on any data storage medium (i.e., floppy disk, compact disk, hard disk, ROM, RAM, etc.) used by a computer system.

      As mentioned earlier, in some environments certain images or items (i.e., icons, background and screen saver  
30       etc.) may not be suitable for display on a desktop. Nonetheless, a user may not want to permanently delete these items from the desktop. The invention uses a plurality of

desktops from which one may be chosen based on the environment in which the computer system is being used.

Two methods of determining when a particular desktop is to be used are going to be described. However, the invention is not restricted to only these two methods. Any other method that may be used to select one of a plurality of desktops to display is well within the scope and spirit of the invention. Furthermore, the invention will be used using the Windows operating system. But, although the Windows operating system is used to describe the invention, the invention is not restricted to this operating system. Any other operating system may be used with the invention so long as one of a plurality of desktops may be chosen based on an environment in which the computer system is being used.

To access and make changes to the desktop, a user needs to depress the right button of a mouse while the desktop is displayed. When this is done, Fig. 4 is displayed. New item 400 allows a user to create a new folder, create a shortcut (i.e., linking an icon to the program the icon represents) and adding new icons to the desktop. Fig. 5 depicts a menu that is displayed when the mouse is on new item 400. In Fig. 5, when a user clicks on folder 500, a new folder is created on the desktop. Likewise, if a user clicks on shortcut 510, the user can point to the location where the item is located such that an icon may be linked to the item.

The invention adds one more item (a desktop item) to Fig. 5. In Fig. 6, desktop item 620 is displayed. To create alternate desktops, a user may click on desktop item 620. When done, a window may pop up requesting that the user enter when the desktop is to be displayed. The user

may enter "anytime except between Monday to Friday, from eight (8) in the morning to five (5) in the afternoon" when possibly the user may be at work. To finalize the change, the user may assert an "OK" button to have the entry stored.

5 Consequently, when the computer system is in use between the time specified, this desktop will be used.

Whenever the user accesses the desktop anytime thereafter (i.e. when a user clicks on the right mouse button while the desktop is displayed), Fig. 7 will be  
10 displayed. In Fig. 7, desktop<sub>1</sub> 700, desktop<sub>2</sub> 710, desktop<sub>3</sub> 720 ... are added desktops. Active desktop 730 is the desktop that is currently being used. Desktops 700 - 720 may be displayed in Fig. 7 with their constraints (i.e., the time between which they will be used). In addition, desktops 700  
15 - 720 may be customized when active. To activate the desktop a user may double click on the particular desktop. When that is done, the user may customize the desktop as it is usually done.

Alternatively, depending on the network connection or  
20 the IP (Internet Protocol) address of the computer system the user is currently using, the invention may determine which desktop to display. An IP address is an identifier for a computer system or device on a TCP/IP (Transmission Control Protocol/Internet Protocol) network. TCP/IP is a  
25 suite of protocols used to connect computer systems on the Internet. Networks using the TCP/IP protocol route messages based on the IP address of the destination system. Thus, each computer system on the Internet has a unique IP address.

30 The IP address consists of four numbers separated each by a period. Each number may be between zero (0) and 255. For example, 1.160.10.240 may be an IP address. The four

numbers are used to identify a particular network and a specific computer system on that network. Thus, each company that has a network (i.e., an Intranet) is assigned a number identifying the network.

5        Thus, the invention may be designed or the user may specify ahead of time that if the computer system is behind a company's firewall (i.e., is part of a company's Intranet) a particular desktop is to be displayed. Thus, when the user is creating a desktop, a window may pop open requesting  
10    that the user confirm that the desktop is to be displayed only when the computer system is behind the company's firewall. If the user does so confirm, the IP address of the computer system may be stored in association with the desktop. Whenever, the computer is turned on, it will check  
15    to see whether it is within the company's Intranet. If so, the desktop will be used. If not, a default desktop may be used or another desktop which may be associated with another IP address may be displayed. That is, the user may also associate a desktop with the IP address the computer system  
20    would have when used at home.

      Note that, if the computer system does not know its IP address, it can simply use the reverse address resolution protocol (RARP) to find out its own address. ARP (address resolution protocol) is the protocol used by TCP/IP to  
25    convert a physical address into an IP address. A computer system wishing to find out an IP address of another computer system broadcasts an ARP request onto the network or Internet. A computer system on the network that has the IP address responds with its physical address. RARP, on the  
30    other hand, is used to obtain a computer system's own IP address. A computer system wishing to find out its own IP address broadcasts its own physical address on the network

and the RARP server (the server that assigns IP address to the computer systems in the network) will reply with the computer system's IP address. Thus, as the computer system is turned on, it can request its own IP address if it does not already know it. Based on its IP address, it can use the appropriate desktop.

The invention may also be used for commercial purposes. For example, when a user accesses the Internet through an ISP (Internet Service Provider), the ISP may download onto the user's computer system a desktop. The desktop may have icons representing goods that are for sale, advertisements, links to Websites etc. Depending on the implementation, when the user exits the Internet, the desktop may or may not remain on the user's computer system.

Fig. 8 is a flow diagram of the invention using the scheduler method. The process starts as soon as the computer is turned on (step 800). A check is made as to whether there exists a time specified desktop. If not, the regular or a default desktop is used (steps 805 and 810). If so, a check is made as to whether the present time is within the time specified (steps 805 and 815). If not, the regular or default desktop is used (step 820). If the time is within the specified time, the desktop associated with the specified time is used.

Fig. 9 is a flow diagram of the invention using the IP address method described above. Again, the process starts when the computer system is turned on (step 900). Then a check is made to determine whether there is a desktop associated with an IP address. If not, the regular or default desktop is used (steps 905 and 910). If yes, then another check is made to determine whether the associated IP address is the same as the computer system's IP address

(steps 905 and 915). As mentioned above, if the computer does not know its IP address, it may send a query to figure it out. Of course, if the computer is not connected to the Internet or a network, the query may not be sent. At this point, the regular or default desktop may be used. In any case, provided that the computer system is on a network and the IP address returned is the same as the IP address stored with the desktop, this particular desktop is then used (step 925).

10 The description of the present invention has been presented for purposes of illustration and description, and is not intended to be exhaustive or limited to the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art. The embodiment was chosen and described in order to best explain the principles of the invention, the practical application, and to enable others of ordinary skill in the art to understand the invention for various embodiments with various modifications as are suited to the particular use contemplated.

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